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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,856	01/12/2004	Maurice Gell	UCT-0040	8424
23413	7590	08/16/2007	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			SAVAGE, JASON L	
			ART UNIT	PAPER NUMBER
			1775	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/755,856

Applicant(s)

GELL ET AL.

Examiner

Jason L. Savage

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 8-7-07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) 1-15, 32, 53-58, 61 and 62 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 63 is/are allowed.
- 6) ☐ Claim(s) 16-23, 26-31, 33-40, 43-52, 59 and 60 is/are rejected.
- 7) ☐ Claim(s) 24-25, 41-42 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7-25-07 has been entered.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 16-31, 33-52 and 59-60 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation that the splats have an average diameter of "greater than about 0.1 micrometer" is not described in the specification and is considered new matter which should be removed from the claims.

***Claim Rejections - 35 USC § 102/103***

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The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 16-23, 26-31, 33-40 and 43-52 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Padture et al. (Acta Mater. 49 (2001) 2251-2257 – article “Towards Durable Thermal Barrier Coatings with Novel Microstructures Deposited by Solution Precursor Plasma Spray) .

With respect to claims 16-18 Padture discloses a thermal sprayed coating comprising containing novel microstructures which is formed by solution precursor plasma spray (abstract). During the interview with Dr. Gell's on 7-18-07, it was stated that the solution precursor plasma spray method described by Padture resulted in splats having the claimed size, but were not able to be identified with the processing method used at the time. As such, Padture would anticipate the claim limitations.

The Patent and Trademark Office can require Applicant to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on Applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, In re Best, Bolton, and Shaw, 195 U.S.P.Q. 431 (CCPA 1977).

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In the alternative, if there is a difference it would be minor and as such would have been obvious.

With respect to claims 19-21 and 29 Padture discloses that the coating is porous and may have a porosity of 16.4% (p. 2253, Results) and since the structure is a microstructure, the pores are considered less than micrometer sized.

With respect to claims 22-23 and 39-40, although Padture does not explicitly recite the coating have at least one interpass boundary, it teaches that the sprayed coating may conventionally be used as a Thermal Barrier Coating which is typically applied to a alumina surface of a bond coat (p. 2255 – Discussion). It is the position of the Examiner that the alumina coating would meet the limitation of being an interpass boundary. Regarding the thickness as recited in claims 23 and 40, although Padture is silent to the thickness, the alumina formed layer would be relatively thin. Absent a teaching of the criticality of showing of unexpected results, the claimed thickness would not provide a patentable distinction over the prior art.

With respect to claims 26-27 and 47, Padture teaches the coating have at least one vertical crack (p. 2255 – Discussion and Figure 2(a)). Regarding claims 27 and 47, the cracks appear to have lengths equal to the thickness of the coating (Figure 2(a)).

With respect to claims 28, 30 and 48, Padture teaches the coating thickness may be 250 micrometers and the crack spacing is between 100-300 micrometers which meets the claim limitations (p. 2252 – Processing and p. 2254 – Results and Figure 2(a)).

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With respect to claims 31, 33-36, the coating of Padture is a thermal barrier comprising a yttria stabilized zirconium oxide comprising 7 percent by weight of yttria (p. 2252 - Processing).

With respect to claims 37-38, 43-45, 49-52, as previously set forth above, Padture teaches a thermal barrier coating having splats within the claimed size range, thickness of 250 micrometers, vertical cracks and porosity of 16.4%.

With respect to claim 46, the porosity in the coating of Padture would be three dimensional.

Claims 16-23, 29-31, 33-40, 43-46, 49-51 and 59-60 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chow et al. (US 2002/0031658).

Chow discloses a method thermal spray coating employed fine droplets which form aggregate splat microstructures having a dimensions smaller than those using powder feedstock (par. [0024]). Chow further teaches that the splat particle microstructures in the formed coating have a particle size less than 0.1 micron (par[0031]). Although the claims recites the splat diameter is greater than about 0.1 micrometers, less than 0.1 micron would be considered to be about (emphasis added) greater than 0.1 microns and thus anticipate the claims. In the alternative, Applicant has not shown or taught how a material having splats with a diameter of greater than about 0.1 microns would provide a material or structural difference in a material having splats with a diameter of less than 0.1 microns taught by Chow. Specific claimed

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material, whose structure are in such close proportions to those in the prior art that, prima facie one skilled in the art would have expected them to have the same properties, must be considered to have been obvious, *Titanium Metals Corporation of America V. Banner*, 227 USPQ 773. Applicant has produced no evidence to rebut that prima facie case.

Regarding claims 17-18 and 43-44, since the splats have a diameter of less than 0.1 microns, one would expect that the thicknesses and diameters of all the splats would fall within the ranges claimed of less than 0.8 microns and 5 microns.

Regarding claim 19-21, 29, 37, 45-46 and 59, Chow does not explicitly recite the porosity of the material, however it teaches that coatings may be subjected to post deposition techniques which allow for tailoring and adjustment of the coating properties including the porosity (par. [0039]). It would have been within the purview of one of ordinary skill in the art to have formed the material to have a porosity which would allow for it to be suitable in the application in which it is intended to be used. Since the structure is a microstructure, the pores are considered less than micrometer sized.

With respect to claims 22-23, 30 and 39-40, Chow teaches that various coatings may be applied including graded coatings (par[0037]). Such a graded coating would be considered to have an inter pass boundary layer. Regarding the thickness as recited in claims 23, 30 and 40, although Chow is silent to the thickness, it would have been within the purview of one of ordinary skill in the art to have inter pass boundary layer to have a thickness which would allow for it to be suitable in the application in which it is intended to be used.

With respect to claims 31, 33-37 and 49-51, Chow teaches the protective coating material may be used as thermal barrier coatings (par[0004]). Chow further teaches the coating material may comprise a wide variety of materials including alumina-yttria stabilized zirconia (par[0037]). Although Chow does not explicitly recite that the material comprise 7% by weight of yttria, it would have been within the purview of one of ordinary skill in the art to have selected a conventional thermal barrier coating composition including one which includes 7% by weight of yttria with a reasonable expectation of success.

Regarding claim 60, although Chow teaches coatings which may have layers which are considered to be inter pass boundaries, it also teaches coatings which are a single layer/material and thus would meet the limitation of having no inter pass boundaries (par[0037]).

Claims 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Padture et al. (Acta Mater. 49 (2001) 2251-2257 – article “Towards Durable Thermal Barrier Coatings with Novel Microstructures Deposited by Solution Precursor Plasma Spray) as applied to claims 16-23, 26-31, 33-40 and 43-52 above, further in view of Chow et al. (US 2002/0031658).

Padture teaches what is set forth above but it is silent to forming a coating having the claimed splat structures wherein the porosity is 10% or less. Chow discloses a method thermal spray coating employed fine droplets which form aggregate splat microstructures having a dimensions smaller than those using powder feedstock (par.



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[0024]). Chow further teaches that the coatings may be subjected to post deposition techniques which allow for tailoring and adjustment of the coating properties including the porosity (par. [0039]). It would have been within the purview of one of ordinary skill in the art to have recognized that the porosity of the coating of Padture could be adjusted from 16.4% to other porosity values in order to tailor the material to be suited for the application in which it will be used. Absent a teaching of the criticality or showing of unexpected results when the porosity of the claimed coating is 10% or less, it would not provide a patentable distinction over the prior art of Padture as modified by Chow.

### ***Allowable Subject Matter***

Claim 63 is allowed.

Claims 24-25 and 41-42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

Applicant's arguments filed 7-25-07 have been fully considered but they are not persuasive.

### **35 USC 112 Rejection**

Applicant argues that the limitaiton of the average diameter of greater than about 0.1 micrometer would be considered as lying within the disclosed range of less than or

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equal to about 2 microns by one of ordinary skill in the art. However, the argument fails to show Applicant had clear possession and/or support for the new range endpoint. As such, the limitation is still considered to be new matter.

### 35 USC 102(b)/103(a) Rejection

Regarding the rejection to claims 16-23, 26-31, 33-40 and 43-52 in view of the article of Padture, Applicant argues that Padture is silent to the recited splat size and in contrast recites the absence of horizontal, strength-degrading "spats" boundaries/cracks (emphasis added). Applicant further disagrees with the Examiner's contention that the polycrystalline particle referred to in Padture is a splat that has a size within the claimed range. Applicant states the Examiner is confused regarding the difference between a splat and grain. During the interview with Michelle Henderson and Dr. Maurice Gell on 7-18-07, the Examiner asked how the solution-precursor plasma spray process of Padture would form a polycrystalline particle whereas the solution-precursor plasma spray process of the present invention forms splats. Dr. Gell stated that the splats were in fact formed, but were not able to be identified with the processing method used as described by Padture. Dr. Gell further stated that the particle is what remained and could be identified using the scanning electron microscope.

In light of Dr. Gell's admission, the claims would be anticipated by the Padture article since the splats were formed, but presumably not identified using the processing technique in the reference. Regarding a suggestion that the recited splats would be

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patentable since they are not described by Padture, something which is old does not become patentable upon the discovery of a new property (see MPEP 2112).

Applicant also disagrees with the Examiner's argument that Dr. Gell's statements in the Declaration are not commensurate with the claims. Applicant states that since a columnar-grain structure is characteristic of a splat and the claims are specifically limited to a particular splat size, it should not be necessary to amend the claims to include a columnar-grain structure before the Examiner will take Dr. Gell's Declaration into consideration. As was recited previously, the claims do not recite any columnar-grain structure, as such the disclosure by Dr. Gell that such a structure is formed is not commensurate in scope with the claims. Furthermore, in light of the disclosure during the interview on 7-18-07, it is not clear whether the structure of Padture would have a columnar-grain structure as well.

#### Second 35 USC 103(a) Rejection

Regarding the rejection to claims 59-60 over Padture in further view of Chow, Applicant's arguments are directed to whether Chow would read on the claimed splat size. However, Chow is relied upon as a teaching that it is known to subject coatings to post deposition techniques which allow for tailoring and adjustments of the coating properties including the porosity. As such, Applicant's arguments that Chow does not teach the claimed splat size are not persuasive.

Furthermore, regarding Applicant's argument that Chow teaches a splat size of less than about 0.1 micron whereas the claims recite a splat size of greater than about


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0.1 micron, Chow is still viewed to read on the claimed invention as recited in the rejection above.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jason Savage  
8-13-07



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8/14/7